THE EFFECT OF DIABETES MELLITUS ON THE PRESENTATION OF DEPRESSION IN A PRIMARY CARE POPULATION IN SAUDI ARABIA

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Master's Dissertation to obtain the Master's Degree in Primary Care Mental Health

NOVA Medical School | Faculdade de Ciências Médicas

February 2018

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Acknowledgement

Perseverance is an attribute that allows anyone to accomplish a daunting task in life. I am full of gratitude to Almighty Allah for bestowing me such an attribute; it ameliorated in transcribing the dream into a real.

I would like to extend my gratitude thanks and appreciation to my supervisor Dr. Lucja Kolkiewicz for her support and help for production of this work.

Hats off to The Nova University Lisbon Portugal stuff for sponsoring the postgraduate MSc PMHC program and providing a chance for graduating specialists in the field of PMHC services.

Special thanks and gratefulness for my brother and mentor Prof. Gabriel Ivbijaro for his guidance, support, and encouragement my promotion in the field of PMHC.

Finally, a bundle of thanks to my family for enhanced caring and sharing attitude during intellectual infatuation for this project.

Abstract

Background: Depression is a common disorder with more than 300 million people worldwide. The comorbidity of depression and diabetes has a high prevalence rate. Collaborative care in diabetes should include screening for depression and patients with depression should be screened for diabetes for better patients care outcome.

Objective: To identify the effect of diabetes mellitus on the depression presentations in the primary-care centers.

Method: A case-control study was conducted at 11 PHC centers during April-May, 2017. Out of 185 patients who fulfill the study criteria, 74 who had depression with co-morbid with diabetes formed the *Case-sample***,** 111 depressed patients not co-morbid formed the *Control sample.*

PHQ-9 used as the diagnostic tool for depression. The satisfaction level and patients' file were assessed and explored the diagnosed and missed cases by the PHC doctors. Data were analyzed using SPSS version 20. Odds ratios (OR) demonstrated with their 95% confidence intervals (CI) and P–value $\leq$ 0.05.

Results: Comorbid depression and diabetes have a significantly high mean of TG and HbA1c. Physical activity and sleep pattern were better among comorbid cases. At the same time, they were unsatisfied with their care in the PHC centers.

Most of the depressant patients were missed by their PHC doctors (74%), that worse when the patients had comorbid with diabetes (85%) with significantly different (p-value=0.005).

Conclusion: In diabetic patients, depression is mostly missed by the PHC physicians. Therefore, depression should be predicted in diabetic patients particularly, uncontrolled diabetes, unsatisfied patients. integrated depression management in diabetic care is necessary to improve clinical outcomes and reduce the burden of illness

Keywords: Diabetes, depression, comorbid depression, integrated mental health care, PHC, Saudi Arabia.

Introduction

Depression is a common disorder, more than 300 million people worldwide are suffering from depression, according to the World Health Organization[1]. Depression has a negative economic impact on governments, employers, and households. It causes a drop in the worldwide productivity, costing the global economy more than $1 trillion, and annual death rate of 800,000 worldwide[1].

Depression is twice as common in diabetic patients as in the general population, and co-morbid depression and diabetes are associated with poor outcomes. A recent study by this author and his collaborators demonstrated that the prevalence of depression among diabetic patients is 48.7%[(2)]. Depression presents in one of every four people with type 2 diabetes mellitus and increases the risk of the development of diabetes and the subsequent risks of hyperglycemia, insulin resistance, and micro- and macrovascular complications. Conversely, a diagnosis of diabetes increases the risk of depression incident and its severity[3].

Co-morbid depression and diabetes have a high prevalence rate[4]. Depression in diabetic patients increases the risk of developing diabetic complications, disability, and early mortality. A meta-analysis study was done by de Groot (2001) to test the strength and consistency of the relationship between depression, and diabetes complications showed a significant association between depression and a variety of diabetes complications; diabetic retinopathy, nephropathy, neuropathy, macrovascular complications, and sexual dysfunction[5].

However, Diabetes is considered as one of the risk factors for depression particularly among those who are using insulin compared with noninsulin medications[6,7]. The

mortality risk in diabetic patients increased in the presence of depression or anxiety, and highest for depression[8].

There is evidence that shows that depression and type 2 diabetes may share the same biological markers and risk factors such as overactivation of innate immunity leading to a cytokine-mediated inflammatory response, and potentially through dysregulation of the hypothalamic-pituitary-adrenal axis[9]. Eventually, understanding of shared origins of depression and diabetes could offer the potential to treat and improve outcomes of both disorders simultaneously, which are targets for primary prevention of type 2 diabetes[9]. Other reports show that depression and diabetes mellitus occur together, approximately twice as frequently as occurring alone[10] and have a bi-directional association[11,12].

Other studies show that patients with depression have a 37 % increased risk of developing diabetes[13], and depression increases by 15 % in people who have diabetes[14]. Depression is common among people with diabetes and negatively affects diabetic control[15].

Chen et al. (2013) indicated an association for depression predicting the onset of diabetes[11]. The combination of both disorders worsens the outcome of either condition. This association also worsens the quality of life, worsens self-management, increases the incidence of complications, and life expectancy[16], and the costs of treatment increase significantly[17].

The presence of diabetes affects depressive symptom control; the symptoms appear to be persistent in 73 % of people 12 months after a diabetes occurrence[18]. The relapse rate for depression is 79 % over a 5-year period[19]. Consequently, depressive episodes

with diabetes are more likely to be persistent and relapse more. In contrast, depressive symptoms usually last 8–12 weeks when occurs alone[6]. The development of two or more diabetes complications showing the strongest association with depression[5,20]. Lin et al. (2004) found that major depression in PHC settings affects the physical activity, unhealthy diet, and lower adherence to oral hypoglycemic, antihypertensive, and lipid-lowering medications negatively[21]. Thus, the evidence recommends the need to have an effective diagnosis and management of depression in diabetic patients[22].

The evidence from the literature suggests that health promotion in people with diabetes should include screening for depression and vise versa[21]. In this study, I will explore the effects of diabetes mellitus on depressive symptoms in a population of people attending primary care clinics in Saudi Arabia.

Study Rationale:

PHC/Family doctors need to predict the symptoms of depression among diabetic patients for early diagnosis and management. Hopefully, the better outcomes of both depression and diabetes mellitus care. This was supported by recommended by Guo et al. (2015) that, working on minimizing depressive symptoms may enhance depression and diabetes adaptation concerning metabolic control and quality of life[23].

Aim:

To identify the effect of diabetes mellitus on the depression presentations in the primary-care centers.

Literature Review:

Epidemiology:

A National Health Interview Survey (NHIS) involved 30,022 adults done in the USA and found that diabetic patients had a high prevalence rate (77.8%) of comorbid major depression[24] . also they stated that depression and diabetes had higher likelihoods of functional disability compared with individuals with either diabetes or major depression alone. It showed those who do not have diabetes and no major depression (24.5%); major depression (51.3%); diabetes (58.1%). The functional disability is 2.42 (2.10–2.79) for diabetes, 3.00 (95% CI 2.62–3.42) for major depression[24].

A study conducted by Talbot and Nouwen (2000) concluded that the initial onset of major depressive disorder seems to be independent of the onset of type 2 diabetes[25]. Moreover, in both type 1 and type 2 diabetes; diabetes-related psychological and physiological processes may be involved in the higher recurrence and longer duration of depressive symptoms[25]. It is estimated that 50% of co-morbid patients remain undiagnosed and more than that was untreated[26,27].

Diabetes and depression are highly prevalent condition and have a significant impact on health outcomes. Both disorders with significant morbidity, mortality, and healthcare cost. Coexisting depression in diabetic patients is associated with fewer adherences to treatment, poor metabolic control, higher complication rate, decrease the quality of life, increased health care use and cost, increased disability and loss production, and increase the risk of death. Coordinated strategies for clinical care are necessary to improve clinical outcomes and reduce the burden of illness[28].

Depressive patients are more likely to be less active, unhealthy diets, which may contribute to the increased risk of developing type 2 diabetes[29,30]. Presence of depression among diabetic patients leads to nonadherence to self-care management[31,32].

Disrupted sleep patterns are associated with depression[33], and poor sleep quality and altered circadian rhythms have been shown to increase insulin resistance and risk of type 2 diabetes[34]. A meta-analysis showed that depression is weakly associated with insulin resistance, a potential link to type 2 diabetes incident[35].

A systematic review study found that, no difference in the rates of depression between those with undiagnosed diabetes, those with impaired glucose metabolism, and people with normal glucose metabolism[36].

Correlation between Depression and Diabetes

There have been many studies examining the relationship between diabetes and depression and they suggest that the association between depression and diabetes is bi-directional[37,38]. In type 2 diabetic patients, the rates of depression are higher with using insulin compared with noninsulin or dietary and lifestyle modification alone[7,39]. The presence diabetic complications, particularly sexual dysfunction and painful peripheral neuropathy found to be predictable for depression incidence[5,40].

Depression and diabetes are associated with the hypothalamic-pituitary adrenal (HPA) axis dysfunction, which acts as subclinical hypercortisolism, blunted diurnal cortisol rhythm, or hypocortisolism with impaired glucocorticoid sensitivity, and increased inflammation[41]. In an extensive epidemiological literature review done by Goodnick

(2001) focused on the biochemistry of diabetes, involved animal and human, explored the effects of alterations in catecholamines and serotonin on glucose utilization[42].

Clinical consequences of comorbid depression and diabetes, a cohort study for 13 years completed 1,897 depressive patients were interviewed in 1981, to determine whether depression is associated with an increased risk for onset of diabetes. It found major depressive disorder signals increased the risk for onset of type II diabetes, but not milder forms of depression or other forms of psychiatric disorder (R.R=2.23). This relation not affected by age, race, sex, socioeconomic status, education, use of health services, other psychiatric disorders, and body weight. However, there is a possibility that the treatment for depression led to an earlier diagnosis of diabetes[43].

Depression and Diabetes Comorbid burden:

The clinical burden of disease, Egede et al. (2002) studied the odds of diagnosed depression among diabetic patients and its effects on health care use and expenditures. They found diabetic patients with depression had a significantly higher outpatient care use as compared without depression (P<0.0001) and had more prescriptions (P<0.0001), and the total health care expenditures for depressive patients was 4.5 times higher than that without depression (P<0.0001)[44].

A study done by Katon et al. (2008) examined the long-term effects on total health care costs of depression intervention program for diabetic patients' comorbid depression at the primary care level. They concluded that patients who had depression management had improved outcomes and reduced 5-year mean total medical costs

compared with usual care patients. Also, they found that the cost differences were largely explained by the presence of non-managed depression and comorbidity[45].

A population-based National Health and Nutrition Examination Survey, was published in 2005, evaluated the effect of depression on all-cause and coronary heart disease (CHD) mortality among adults with and without diabetes. It proved that the coexistence of diabetes and depression is associated with a significantly increased risk of death from all causes, higher that due to having either diabetes or depression alone[46]. Egede (2004) proved that coexisting depression in diabetic patients is associated with significant increases in mean disability bed days, increases the odds of extended work loss, and extended disability bed days[24].

Antidepressants and Diabetes

Tricyclic-antidepressants plays a role in increasing of catecholamines which appears to increase glucose and reducing insulin release and sensitivity to insulin. In contrast, a selective serotonin reuptake inhibitor (SSRI) increases serotonergic function seems to increase sensitivity to insulin and reduce plasma glucose[42]. Add to that, SSRI demonstrated its usefulness in diabetic patients, with weight loss, in a decrease in the FPG and the HbA1c levels. Lifestyle factors are suggested to have a role in the comorbidity of depression and diabetes[42].

Diagnosis and Management of Comorbid Depression and Diabetes

Depression diagnosis requires a validated interview to consider its diagnosis[47,48]. A quick and cheaper method is needed to screen people in PHC settings[49]. SSRI is the drug of choice, less cardiotoxic and is safer in overdose, for diabetic patients[50]. When

diabetic patients have an intervention for depression management were more likely to be well-controlled (HbA1c < 7%) as compared with in comparison with patients in the usual care group, diabetic without depression intervention[51]. Intervention integrating treatment of type 2 diabetes and depression becomes necessary and be a core of diabetic patient care. Such approach was proved to be successful in improving outcomes in primary care (P<.001)[51].

Therefore, integrated approach to depression and type 2 diabetes treatments cost effeteness for its disposition in real practices with competing demands for limited resources[51]. A reviewed study indicated that there is evidence that suggests psychosocial interventions particularly CBT with effective in improving depression in patients with diabetes. However, these interventions are not consistently associated with improvement in markers of glycemic control (HbA1c levels)[52].

A systematic review and meta-analysis of psychological therapies to assess their effectiveness in improving glycaemic control in type 2 diabetes showed the mean percentage glycosylated hemoglobin was lower in people assigned a psychological intervention than in the usual care; psychological distress was significantly lower in the intervention groups. In the interpretation of type 2 diabetes, there are improvements in long-term glycaemic control and psychological distress[53].

Another review study done by Hermanns et al. (2013) summarized the importance of appropriate screening, diagnosis, and treatment of depression in chronic illness, particularly diabetic patients. They concluded that integrating mental health care among chronic medical ill patients provides a more objective and holistic evaluation; in

stepped care and collaborative management care models, it improves treatment outcomes without overwhelming existing resources[54].

A meta-analysis found that depression was significantly associated with nonadherence to nonadherence to self-care management and diabetes treatment instructions such as missed medical appointments, diet, exercise, medication use, glucose monitoring, and foot care[55].

Self-assessment questionnaires can dramatically improve depression detection rates. Complementing such screening with assessments of psychological distress can have an additional and complementary impact on individual self-care[56,57]. Newly diagnosed diabetic patients were 30% more likely to have the previous history of depression compared with people without diabetes. Depression increases the risk of developing diabetes by 23% in younger adults (20-50 years of age), but not in aged 51 years or more[58].

Elderly depressed patients with diabetes when they had depression care management in PHC, they were less likely to die over a 5-year interval as compared with depressed diabetic patients who in usual care practices[59]. The risk of depression among diabetic patients increased in prior depression history and cardiovascular procedures[60]. There is evidence of depression significantly increases the mortality rate among diabetic patients. Thus, early depression detection and treatment may improve the health outcomes[61].

Collaborative care

Collaborative care showed a significantly better outcome, in depression and diabetes management and patients' adherence to treatment instructions, as compared with usual care. These findings emphasize on applying the collaborative care for diabetic patients with depression[62]. For that, it could have explained by recognizing the diagnosis, the management load, and complications occurrence are associated with depressive symptoms rather than biological mechanisms such as hyperglycemia[6]. Therefore, considering the psychological burden associated with diabetes diagnosis need psychosocial support at the diagnosis time[6]. Comorbid depression adversely affects diabetes outcomes and decreases the quality of life[63].

In children and adolescents, there is a clearer relationship between depressive symptoms and poorer glycemic control[37]. Depression, even if mild, is also associated with premature mortality through a range of physical conditions[61].

For patients with comorbid physical and mental illness, the UK Disability Rights Commission (2006) has highlighted the concept of "overshadowing" where healthcare focus on the mental disorder and fail to provide the care of physical health needs[64]. In contrast, poorer diabetes care for a patient with mental illness, less likely to screen diabetes[65].

Thus, depression and other mental disorders are not diagnosed with diabetes or other physical illness[66,67]. These types of systematic deficiencies within healthcare systems may contribute significantly to the poorer health outcomes seen in those with comorbid diabetes and depression. Combined behavioral and psychotropic depression

with diabetes management in collaboration approach in PHC, improved depressive symptoms as well as glycemic and blood pressure control[68]. Comorbid diabetes and depression have increased direct and indirect health care costs[69].

Such model of care seems to be cost-effective as well as clinically effective, and less out-patient costs[70-72], which is lacking worldwide. Work is needed to implement of comorbid management model to serve comorbid morbidity patient in the PHC settings[6]. Most health services are poorly equipped to deal with comorbidity and, therefore, novel care pathways are needed to address this important public health problem[6].

Multidisciplinary team approaches to diagnose and manage of depression in PHC settings that incorporate high-risk cases, and psychotropic medications using a stepped-care approach shown to be the most effective clinical outcomes and positive improvements in depression outcomes among diabetic patients[26].

Therefore, the collaborative management considering mental health and physical problems in a holistic approach is a cost-effective and reducing the health care utilization, thus screening for co-morbid depression proves to be cost-saving[54].

Methods

Study setting:

This case-control study was conducted at the PHC centers (11 centers) in Al-Khobar city, Saudi Arabia.

Sampling procedure:

Out of the 388 patients invited to participate in this study during April-May, 2017, 368 patients completed the questionnaire with respond rate of (95%). Out of them, 185 patients who fulfill the study criteria; who had depression only or depression comorbid with diabetes were included in the study. Only 74 patients who had depression with co-morbid with diabetes, and formed the *Case-sample***.** The rest 111 depressed patients not co-morbid with diabetes formed the *Control sample.*

Depression Assessment:

Patient Health Questionnaire-9 (PHQ-9) used as the diagnostic tool for depression[73]. It was modified from PHQ-8 and has been used in several hundred studies to assess both mentally and physically ill patients[74], including studies with patients with diabetes[74]. PHQ-9 score $\geq$ 5 was considered as positive for depression.

Satisfaction Assessment:

The satisfaction level among depressive patients was assessed by a direct question about their satisfaction regarding the care which providing to them in the PHC center for their condition. The patients' perception was assessed by a 5-scaled question; 1 is the lowest level, and 5 is the highest satisfaction level.

Missed cases by PHC doctors:

The studied patients' file was reviewed to define the depressant patients who were diagnosed by their PHC doctors, and those who not diagnosed before. Those who were not diagnosed and only discovered by the screening tool were considered as missed cases.

Data collection:

Data collection was a two-stage process:

Stage one: A self-administered questionnaire was completed by participants to gather socio-demographic information, information about the chronic disease and lifestyle.

All participating patients were asked to complete a PHQ-9 an Arabic version. There two trained persons for interpretation and filling the questionnaires for illiterate patients.

Stage Two: The patient medical records/files review for all patients who filled the questionnaire to obtain information about weight, height, BP, lab tests profile, complications, and treatments.

Statistical analysis:

Data were entered and analyzed using SPSS version 20. Data were presented as Mean ± SD for quantitative data, and number (N) and percentage (%) for qualitative data. Student t-test, Chi-square test, biserial correlation were used when appropriate. Odds ratios (OR) demonstrated with their 95% confidence intervals (CI) and P–value, considered significant at p-value $\leq$ 0.05.

Ethic issue:

Administrative permission, as well as Institutional Review Board approvals, were obtained from the MOH in Eastern Province of Saudi Arabia, and Informed consent obtained from all participants.

Results

From 388 questionnaires were distributed, 368 were completed and retained with a response rate of 94.8%, females formed 51.4% (n=189). Out of them, 185 patients filled the study criteria, depression only or depression comorbid with diabetes. The case-sample was 74 patients who had depression with co-morbid with diabetes, and 111 depressed patients not co-morbid with diabetes.

Socio-demographic characteristics of the studied sample:

The distribution of the studied sample according to socio-demographic characteristics demonstrated that there is no significant difference between the case and control samples. The mean age (± standard deviation) of the studied sample was 44.7 years ± 11.6. More than half of the participants (68.6%) were female. The majority of the studies sample were married (75.7%). Sixty percent (60%) of the participants had their own house.

Regarding the education level among the studied sample, 15.1% was illiterate, 30.3% and 27% were of primary and secondary education respectively, while 27.6% had university and postgraduate education.

Table (1) shows no difference between depressive cases with and without diabetes mellitus according to the weight and blood pressure, cholesterol, and vitamin serum D level. But, the depressive comorbid patients had a significant difference in their diastolic reading, and LDL level was less than depression without diabetes. That could be related to diabetic control management i.e. diet and lifestyle modification.

Table (1) Comparison between depressive cases with and without diabetes mellitus according to the basic physical and laboratory findings, (PHQ-9 score ≥ 5).

	Depression comorbid with DM (N=74)	**Depression without DM (N=111)**	**P-value**
	Mean ± SD	**Mean ± SD**	
Weight	80.76 ± 16.9	78.84 ± 19.5	0.489
Height	158.07 ±15.7	160.03 ± 12.8	0.355
BMI	31.44 ± 6.8	30.64 ± 9.7	0.541
SBP	125.84 ± 14.9	122.5 ±17.8	0.186
DBP	72.97 ± 8.0	77.15 ± 11.4	0.007
FBG	168.5 ± 67.9	93.82 ± 13.0	<0.0001
HBA1c	8.65 ± 2.1	6.42 ± 5.2	<0.001
TG	164.85 ± 98.3	124.9 ± 44.2	<0.0001
Total cholesterol	186.51 ± 38.2	188.43 ± 35.1	0.724
LDL	105.69 ± 32.7	114.77 ± 33.6	0.07
HDL	46.71 ± 15.4	48.56 ± 10.9	0.341
Vitamin D	17.87 ± 4.2	20.08 ± 10.3	0.082

Table-2 demonstrates that the physical activity and sleep pattern is a better significantly difference among depression comorbid with diabetic comparing without, p-value= 0.009, <0.0001, respectively. Other habits such diet control, weight change, smoking, and alcohol intake have no significant difference.

Table 2. Effect of DM on depressive patients' socio-characters, (PHQ-9 score ≥ 5).

Lifestyle	Depression comorbid with DM n (%)	Depression without DM n (%)	Odds Ratio	P-value
Diet control:				
- Yes	52(70.3)	79(71.2)	0.957	**0.895**
- No	22(29.7)	32(28.8)		
Physical activity:				
- Yes	60(81.1)	70(63.1)	2.5	**0.009**
- No	14(18.9)	41(36.9)		
Sleep difficulties:				
- Yes	40(54.1)	90(81.1)	0.275	**<0.0001**
- No	34(45.9)	21(18.9)		
Weight change:				
- Yes	43(58.1)	64(57.7)	1.02	**0.952**
- No	31(41.9)	47(42.3)		
Smoking:				
- Yes	20(27.0)	21(18.9)	1.587	**0.193**
- No	54(73.0)	90(81.1)		
Alcohol:				
- No	73(98.6)	109(98.2)	0.747	**0.812**
- Past History	1(1.4)	2(1.8)		

Table (3) demonstrates that the satisfaction level among depressive patients without co-morbid diabetes mellitus is significantly high as compared with depressive patients when they have a comorbid with diabetes, the Odds Ratio=0.268 (CI=0.097-0.742).

Table 3. Satisfaction level among depressive patients co-morbid with DM and not comorbid, (PHQ-9 score ≥ 5).

	DM (N=74) **n (%)**	**No DM** (N=111) **n (%)**	**Odds Ratio**	**P-value**
Satisfaction:				
- Yes	61 (82.4)	105 (94.6)	0.268	0.008
- No	13 (17.6)	6 (5.4)		

Most of the depressant patients (74%) in our sample were missed by their PHC doctors especially when the patients had comorbid with diabetes (85%). This is reflecting how the comorbid with diabetes affected worse the doctors' ability to discover the depression in PHC centers, as illustrated in table-4.

Table 4. Comparison between diagnosed and missed depressive patients by PHC doctors related to the presence of diabetes mellitus, (PHQ-9 score ≥ 5).

Depression	Total n (%)	DM n (%)	No DM n (%)	Odds Ratio	P-value
- Diagnosed by PHC Doctors	48 (26)	11(15)	37(33)	0.349	0.005
- Missed by PHC doctors	137 (74)	63(85)	74(67)		

The patients with depression and comorbid with diabetes scored a significantly higher for the sleep disturbance, feeling tired, loss of concentration, and prefer to die as compared with depressive patients only, p-value= (0.035), (0.018), (0.005), (0.006) respectively.

Discussion

This study is the first study, up to known to the author, studied the effect of diabetes mellitus on the depression presentation in Saudi Arabia.

The socio-demographic characteristics testing supports the accuracy of the case and selective control process. Where there is no significant difference between the cases and the control candidates, and the relation between depression alone and presented with comorbid with diabetes not affected by their age, gender, marital status, education level, occupation, income, and BMI, it goes consistency with Eaton et al. (1996) findings[43].

Table-1 shows no difference between depressive cases with and without diabetes mellitus according to the weight and blood pressure, cholesterol, and vitamin serum D level. But, the comorbid depressive patients with diabetes have a significant difference in their diastolic reading, and LDL levels were less than depression without diabetes. That could be related to diabetic control management, i.e., diet and lifestyle modification. However, in our sample the diabetic patients' comorbid with depression have a significantly high mean of TG and HbA1c which indicates an uncontrolled DM related to the presence of depression. This finding is supported by other studies which showed a strong linear relationship as scored high on the PHQ-9 had higher HbA1c[76,77]. As approved by Bot et al., (2013) that, a higher HbA1c level indicated more with comorbid diabetes coexisted with depression[78]. This finding supports the needs for the integrating treatment of both disorders by PHC doctors for better patient care, which supported by the Bogner et al., (2012), and the Hermanns et al. (2013) findings[51,54].

Table-2, both physical activity and sleep pattern are better among diabetic comorbid with depression comparing. In contrary, sleep disturbance which significant associated with predicting diabetes, which is concomitant with others studies finding[78-80]. However, other habits such diet control, weight change, smoking, and alcohol intake didn't demonstrate an effect. In general as cited in different studies, depressive patients are more likely to be less active, unhealthy diets, which may contribute to the increased risk of developing type 2 diabetes[29,30]. The health education receiving in the diabetic clinic follow-up could help in improving the physical activity among diabetic comorbid with depression comparing without combined. Add to that; sleep pattern is better among comorbid could frequent visit to the diabetic clinic plays a role as a supportive therapy or consequent effect of physical activity improvement. These behaviors should be considered in the diabetic clinic education hopefully, would contribute to the depression management, which was emphasized on applying the collaborative care for diabetic patients with depression by Huang et al., (2013)[62].

Table (3) demonstrates that comorbid depression and diabetes were significantly unsatisfied for their care in the PHC centers. We keep in mind in this study most of the depressive patients not aware of their diagnosis, only discovered by screening. Therefore, this finding could be related to the load of the morbidity and the commitments to the regular follow-up which, could affect adversely on the patients psychologically. It is supported by Guo et al. (2015) findings that, increase depressive symptoms was associated with less patients' satisfaction[23]. Biochemistry of both depression and diabetes could have a role, increase the cortisone, and alter the catecholamines, and serotonin levels[41,42].

Table-4 Most of the depressant patients among the participants were missed by their PHC doctors, that worse when the patients had comorbid with diabetes. It is reflecting how the comorbid with diabetes worse the doctors' ability to discover the depression in PHC centers. Such finding was cited in WHO/Wonca Report (2008)[81], a there high rate of missed cases of minor mental health such as depression in PHC settings, as goes with Lawrence et al., (2002), and Frayne et al., (2005) findings[66,67].

As cited by Silverstein et al., (2015) such findings highlight the need for regular depression screening and appropriate management for patients, particularly among chronic physical disorders[82]. Add to that, PHC doctors should be efficiently trained for mental health care considering the patient's presentations in the PHC settings, not a psychiatric disorder only, for improving both emotional and metabolic statues[83].

The patients with depression and comorbid with diabetes scored a significantly higher for the sleep disturbance, feeling tired, loss of concentration, and prefer to die as compared with depressive patients only, it consistent with other studies findings[24,40,63]. In contrary, sleep disturbance which significant associated with predicting depression and diabetes which, cited by other authours[33,78-80].

We could conclude from this study integrated depression management in diabetic care is necessary to improve clinical outcomes and reduce the burden of illness, as found by other studies[28,51,54,].

Conclusion

This study demonstrates that the comorbid depression and diabetes have a significantly high mean of TG and HbA1c. Physical activity and sleep pattern were better among comorbid cases. However, the satisfaction level is higher among depressive patients alone.

In diabetic patients, depression is mostly missed by the PHC physicians. Therefore, depression should be predicted in diabetic patients particularly, uncontrolled diabetes, unsatisfied patients, and sleep disturbance. The health education in the diabetic clinic could help in improving the physical activity and sleep disturbance. Therefore, integrated depression management in diabetic care is necessary to improve the clinical outcomes and reduce the burden of illness[84].

Limitation:

This is a case control study with all the limitation of a case control study and does not prove causation. In addition the limited time and resources I had to complete this study may have resulted in limiting the sample size and the population base I have used. However it is still sufficient for me to generalise the findings to other population samples in Saudi Arabia'

Abbreviations:

BMI	Body mass index
BP	Blood pressure
CBT	Cognitive behavior therapy
CI	Confidence Interval
DBP	Diastolic blood pressure
DM	Diabetes Mellitus
FBG	Fasting blood glucose
HbA1C	Hemoglobin A1C
HDL	High-density lipoprotein
LDL	Low-density lipoprotein
MOH	Ministry of health
NHIS	National Health Interview Survey
PHC	Primary health care
PHQ-9	Patient Health Questionnaire-9
SBP	Systolic blood pressure
SD	Stander deviation
SPSS	Statistical Package for the Social Sciences
SSRI	Selective serotonin reuptake inhibitors
TG	Triglyceride
UK	United Kingdom
USA	United State of America
WHO	World Health Organization

References

1. WHO report, 2017: http://www.who.int/mediacentre/factsheets/fs369/en/

2. AlKhathami AD, Alamin MA, Alqahtani AM, Alsaeed WY, AlKhathami MA, Al-Dhafeeri AH. Depression and Anxiety among Hypertensive and Diabetic Primary Health Care Patients: Could sleep disturbance be used as a screening tool for Depression and Anxiety. Saudi Medical Journal; 2017; 38 (6): 621-28.

3. Semenkovich, K., Brown, M.E., Svrakic, D.M. Patrick J. Lustman P.J. Depression in Type 2 Diabetes Mellitus: Prevalence, Impact, and Treatment. Drugs (2015) 75(6): 577-87.

4. Roy T, Lloyd CE. Epidemiology of depression and diabetes: a systematic review. J Affective Disorder, 2012;142:8-21.

5. de Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: a meta-analysis. Psychosomatic Medicine, 2001; 63:619–30.

6. Holt R.I., de Groot M., Golden S.H. Diabetes and Depression. Currant Diabetes Report, 2014;14(6): 1-17.

7. Li C, Ford ES, Strine TW, Mokdad AH. Prevalence of depression among U.S. adults with diabetes: findings from the 2006 behavioral risk factor surveillance system. Diabetes Care. 2008; 31:105–107.

8. Naicker, K., Johnson, J. A., Skogen, J. C., Manuel, D., Overland, S., Sivertsen, B., Colman, I. Type 2 Diabetes and Comorbid Symptoms of Depression and Anxiety: Longitudinal Associations with Mortality Risk. Diabetes Care, 2017; 40: 352-8.

9. Moulton CD, Pickup JC, Ismail K. The link between depression and diabetes: the search for shared mechanisms. Lancet Diabetes Endocrinol. 2015;3(6):461-71.

10. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. Diabetes Care, 2001; 24:1069–78.

11. Chen P, Chan Y, Chen H, Ko M, Li C. Population-Based Cohort Analyses of the Bidirectional Relationship between Type 2 Diabetes and Depression. Diabetes Care, 2013; 36(2): 376-382.

12. American Diabetes Association. Standerds of medical care in diabetes. Diabetes Care. 2017;40(suppl):s4.

13. Knol MJ, Twisk JW, Beekman AT, Heine RJ, Snoek FJ, Pouwer F. Depression as a risk factor for the onset of type 2 diabetes mellitus. A meta-analysis. Diabetologia. 2006; 49:837–45.

14. Mezuk B, Eaton WW, Albrecht S, Golden SH. Depression and type 2 diabetes over the lifespan: a meta-analysis. Diabetes Care. 2008; 31:2383–90.

15. Shirey K, Manyara SM, Atwoli L, Tomlin R, Gakinya B, Cheng S, Kamano J, Laktabai J, Pastakia S. Symptoms of depression among patients attending a diabetes care clinic in rural western Kenya. J Clin Transl Endocrinol,2015; 10;2(2):51-4.

16. Holt RI, Katon WJ. Dialogue on diabetes and depression: dealing with the double burden of comorbidity. J Affect Disorder, 2012; 142:S1–3.

17. Ciechanowski P., Katon W., Russo J. Depression and diabetes: inpact of depressive symptoms on adherence, function, and costs, 2000; 160(21):3278-3285.

18. Peyrot M, Rubin RR. Persistence of depressive symptoms in diabetic adults. Diabetes Care. 1999; 22:448–452.

19. Lustman PJ, Griffith LS, Clouse RE. Depression in adults with diabetes. Results of 5-yr follow-up study. Diabetes Care. 1988; 11:605–12.

20. Steenbergen-Weijenburg KM, van Puffelen AL, Horn EK, Nuyen J, van Dam PS, van Benthem TB, et al. More co-morbid depression in patients with Type 2 diabetes with multiple complications. An observational study at a specialized outpatient clinic. Diabetes Med. 2011; 28:86–9.

21. Lin E. H., Katon W., Rutter C., Simon G., et al (2004). Relationship of Depression and Diabetes Self-Care, Medication Adherence, and Preventive Care. Diabetes Care; 27(9): 2154-2160.

22. de Groot, M., Crick, K. A., Long, M., Saha, C., Shubrook, J. H. Lifetime Duration of Depressive Disorders in Patients With Type 2 Diabetes. Diabetes Care, 2016; 39:2174-81.

23. Guo J, Whittemore R, Jeon S, Grey M, Zhou ZG, He GP, Luo ZQ. Diabetes self-management, depressive symptoms, metabolic control and satisfaction with quality of life over time in Chinese youth with type 1 diabetes. Journal of Clinical Nurse. 2015;24(9-10):1258-68.

24. Egede L.E. Diabetes, Major Depression, and Functional Disability Among U.S. Adults. Diabetes Care, 2004; 27:421–428.

25. Talbot F., Nouwen P.A. A Review of the Relationship between Depression and Diabetes in Adults: Is there a link? Diabetes Care, 2000; 23:1556–1562.

26. Katon W.J., Simon G., Russo J., Von K.M., Lin E.H., Ludman E., et al., Quality of depression care in a population-based sample of patients with diabetes and major depression. Medical Care, 2004; 42 (12):1222–9.

27. Li C., Ford E.S., Zhao G., Ahluwalia I.B., Pearson W.S., Mokdad A.H. Prevalence and correlates of undiagnosed depression among U.S. adults with diabetes: the Behavioral Risk Factor Surveillance System. Diabetes Research and Clinical Practice, 2009;83(2):268–79.

28. Egede L.E., Ellis C. Diabetes and Depression: Global perspectives. Diabetes Research and Clinical Practice, 2010;87:302-12.

29. McMartin SE, Jacka FN, Colman I. The association between fruit and vegetable consumption and mental health disorders: evidence from five waves of a national survey of Canadians. Preventive Medicine. 2013; 56:225–30.

30. Payne ME, Steck SE, George RR, Steffens DC. Fruit, vegetable, and antioxidant intakes are lower in older adults with depression. J Academic Nutr Diet. 2012; 112:2022–7.

31. McKellar J., Humphreys K., Piette J. Depression increase diabetes symptoms by complaicating patients' self-care adherence, 2004;30(3):485-492.

32. Gonzalez JS, Safren SA, Cagliero E, Wexler DJ, Delahanty L, Wittenberg E, et al. Depression, self-care, and medication adherence in type 2 diabetes: relationships across the full range of symptom severity. Diabetes Care. 2007; 30:2222–7.

33. Courtet P, Olie E. Circadian dimension and severity of depression. Europe Neuropsychopharmacol. 2012; 22 (3):476–81.

34. Gangwisch JE. Epidemiological evidence for the links between sleep, circadian rhythms and metabolism. Obes Rev. 2009;10 (2):37–45.

35. Kan C, Silva N, Golden SH, Rajala U, Timonen M, Stahl D, et al. A systematic review and metaanalysis of the association between depression and insulin resistance. Diabetes Care. 2013; 36:480–9.

36. Nouwen A, Nefs G, Caramlau I, Connock M, Winkley K, Lloyd CE, et al. Prevalence of depression in individuals with impaired glucose metabolism or undiagnosed diabetes: a systematic review and meta-analysis of the European Depression in Diabetes (EDID) Research Consortium. Diabetes Care. 2011; 34:752–62.

37. Reynolds KA, Helgeson VS. Children with diabetes compared with peers: Depressed? Distressed? A meta-analytic review. Ann Behav Med. 2011; 42:29–41.

38. Golden SH, Lazo M, Carnethon M, Bertoni AG, Schreiner PJ, Diez Roux AV, et al. Examining a bidirectional association between depressive symptoms and diabetes. JAMA. 2008; 299:2751–9.

39. Hermanns N, Kulzer B, Krichbaum M, Kubiak T, Haak T. Affective and anxiety disorders in a German sample of diabetic patients: prevalence, comorbidity and risk factors. Diabetes Med. 2005; 22:293–300.

40. Kato W., Rutter C., Simon G., Lin E., Ludma E. The association of comorbid depression with mortality in patients with type 2 diabetes. Diabetes Care, 2005;28(11):2668-2672.

41. Champaneri S, Wand GS, Malhotra SS, Casagrande SS, Golden SH. Biological basis of depression in adults with diabetes. Currant Diabetic Report, 2010; 10:396–405.

42. Goodnick P.J. Use of Antidepressants in Treatment of Comorbid Diabetes Mellitus and Depression as Well as in Diabetic Neuropathy. Annals of Clinical Psychiatry; 2001, 13(1):31-41.

43. Eaton W.W, Armenian H., Gallo J., Pratt L., Ford D.E. Depression and Risk for Onset of Type II Diabetes: A prospective population-based study. Diabetes Care, 1996; 19(10):1097-1100.

44. Egede LE, Zheng D, Simpson K. Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. Diabetes Care, 2002; 25:464–70.

45. Katon W.J., Russo J.E., Korff M.V, Lin E., Ludman E., Ciechanowski P.S. Long-Term Effects on Medical Costs of Improving Depression Outcomes in Patients With Depression and Diabetes. Diabetes Care, 2008; 31:1155–9.

46. Egede L.E., Nietert P.J, Zheng D. Depression and All-Cause and Coronary Heart Disease Mortality among Adults with and Without Diabetes. Diabetes Care, 2005;28:1339–45.

47. Robins LN, Wing J, Wittchen HU, Helzer JE, Babor TF, Burk. The Composite

International Diagnostic Interview. An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. Arch Gen Psychiatry. 1988; 45:1069–77.

48. Amorim P, Lecrubier Y, Weiller E, Hergueta T, Sheehan D. DSM-IH-R Psychotic disorders: procedural validity of the Mini International Neuropsychiatric Interview

(MINI). Concordance and causes for discordance with the CIDI. Europe Psychiatry, 1998; 13:26–34.

49. Holt RI, Feltz-Cornelis CM. Key concepts in screening for depression in people with diabetes. J Affect Disord. 2012; 142:72–9.

50. Serretti A, Mandelli L. Antidepressants and body weight: a comprehensive review and metaanalysis. Journal Clinical Psychiatry. 2010; 71:1259–72.

51. Bogner H.R, Knashawn H. Morales K.H., de Vries H.F, Cappola A.R. Integrated Management of Type 2 Diabetes Mellitus and Depression Treatment to Improve Medication Adherence: A Randomized Controlled Trial. Annals Family Medicine, 2012;10:15-22.

52. Balhara Y.P, Verma R. Management of depression in diabetes: A review of psycho-social interventions. Journal of Social Health and Diabetes, 2013;1(1):22-6.

53. Ismail K., Winkley K., Rabe-Hesketh S. Systematic review and meta-analysis of randomised controlled trials of psychological interventions to improve glycaemic control in patients with type 2 diabetes. Lancet 2004; 363: 1589–97.

54. Hermanns N., Caputo S., Dzidac G, Khunti K., Meneghini L.F., Snoekf F. Review Screening, evaluation and management of depression in people with diabetes in primary care. primary care diabetes, 2013;7:1–10.

55. Gonzalez JS, Peyrot M, McCarl LA, Collins EM, Serpa L, Mimiaga MJ, et al. Depression and diabetes treatment nonadherence: a meta-analysis. Diabetes Care. 2008; 31:2398–403.

56. Fisher L., Glasgow R.E., Strycker L.A. The relationship between diabetes distress and clinical depression with glycemic control among patients with type 2 diabetes. Diabetes Care, 2010;33(5):1034–1036.

57. Delahanty L.M, Grant R.W., Wittenberg E., Bosch J.L., Wexler D.J, Cagliero E. et al. Association of diabetes-related emotional distress with diabetes treatment in primary care patients with Type 2 diabetes. Diabetic Medicine, 2007; 24 (1):48–54.

58. Brown L.C., Majumdar S., Newman S.C., Johnson J.A. History of Depression Increases Risk of Type 2 Diabetes in Younger Adults. Diabetes Care, 2005; 28:1063–7.

59. Bogner H.R., Morales K.H., Post E.P., Bruce M.L. Diabetes, Depression, And Death: A Randomized Controlled Trial Of A Depression Treatment Program For Older Adults Based In Primary Care (Prospect). Diabetes Care, 2007; 30(12): 3005–3010.

60. Katon W., Russo J., Lin E.H, Heckbert S.R., Ciechanowski P., Ludman E.J, Korff M.V. Depression and Diabetes: Factors Associated with Major Depression at 5-Year Follow-Up. Psychosomatics, 2009;50(6):570–579.

61. Park M, Katon WJ, Wolf FM. Depression and risk of mortality in individuals with diabetes: a meta-analysis and systematic review. Gen Hosp Psychiatry. 2013; 35:217–25.

62. Huang Y., Wei X., Wu T., Chen R., Guo A. Collaborative care for patients with depression and diabetes mellitus: a systematic review and meta-analysis. BMC Psychiatry 2013, 13:260.

63. Goldney RD, Phillips PJ, Fisher LJ, Wilson DH. Diabetes, depression, and quality of life: a population study. Diabetes Care. 2004; 27:1066–70.

64. UK Disability Rights Commission. A formal investigation into physical health inequalities experienced by people with learning difficulties and mental health problems. London: Disability Rights Commission; 2006. Equal treatment: closing the gap. 89.

65. Mitchell AJ, Malone D, Doebbeling CC. Quality of medical care for people with and without comorbid mental illness and substance misuse: systematic review of comparative studies. Br J Psychiatry. 2009; 194:491–9.

66. Lawrence D, Coghlan R. Health inequalities and the health needs of people with mental illness. N S W Public Health Bull, 2002; 13:155–8.

67. Frayne SM, Halanych JH, Miller DR, Wang F, Lin H, Pogach L, et al. Disparities in diabetes care: impact of mental illness. Arch Intern Med. 2005; 165:2631–8.

68. Katon WJ, Lin EH, Von KM, Ciechanowski P, Ludman EJ, Young B, et al. Collaborative care for patients with depression and chronic illnesses. N Engl Journal Medicine. 2010; 363:2611–20.

69. Molosankwe I, Patel A, Jose GJ, Knapp M, McDaid D. Economic aspects of the association between diabetes and depression: a systematic review. Journal Affect Disorder. 2012; 14:42–55.

70. Simon GE, Katon WJ, Lin EH, Rutter C, Manning WG, Von Korff M, et al. Cost-effectiveness of systematic depression treatment among people with diabetes mellitus. Arch Gen Psychiatry. 2007; 64:65–72.

71. Katon W, Unutzer J, Fan MY, Williams JW Jr, Schoenbaum M, Lin EH, et al. Cost-effectiveness and net benefit of enhanced treatment of depression for older adults with diabetes and depression. Diabetes Care. 2006; 29:265–70.

72. Hay JW, Katon WJ, Ell K, Lee PJ, Guterman J. Cost effectiveness analysis of collaborative care management of major depression among low-income, predominantly Hispanics with diabetes. Value Health. 2012; 15:249–54.

73. Kroenke K, Spitzer RL, Williams JB; The PHQ-9: validity of a brief depression severity measure. J General Intern Med. 2001;16(9):606-13.

74. Kroenke K, Strine TW, Spitzer RL, Williams JB, Berry JT, Mokdad AH. The PHQ-8 as a measure of current depression in the general population. *Journal Affect Disorder* 2009*;* 114*:*163–73.

75. Twist K, Stahl D, Amiel SA, Thomas S, Winkley K, Ismail K. Comparison of depressive symptoms in type 2 diabetes using a two-stage survey design. *Psychosomatic Medicine,* 2013*;*75*:*791–797.

76. Trief P, PM, Xing D, Foster N, Maahs D, Kittelsrud J, Olson B, Young L, Peters L, Bergenstal R, Miller K, Beck R, Weinstock R. Depression in Adults in the T1D Exchange Clinic Registry. Diabetes Care 2014; 37(6): 1563-1572.

77. Ravona-Springer, R., Heymann, A., Schmeidler, J., Moshier, E., Guerrero-Berroa, E., Soleimani, L., Sano, M., Leroith, D., Preiss, R., Tzukran, R., Silverman, J. M., Beeri, M. S. Hemoglobin A1c Variability Predicts Symptoms of Depression in Elderly Individuals With Type 2 Diabetes. Diabetes Care, 2017; 40: 1187-93.

78. Bot M, Pouwer F, de Jonge P, Tack CJ, Geelhoed-Duijvestijn PH, Snoek FJ. Differential associations between depressive symptoms and glycaemic control in outpatients with diabetes. Diabet Med. 2013;30(3):115-122.

79. Bächle C, Lange K, Stahl-Pehe A, Castillo K, Holl RW, Giani G, Rosenbauer J. Associations between HbA1c and depressive symptoms in young adults with early-onset type 1 diabetes. Diabetes Care, 2015;55:48-58.

80. Boyko E, Seelig A, Jacobson I, Hooper T, Smith B, Smith T, Crum-Cianflone N. Sleep Characteristics, Mental Health, and Diabetes Risk: A prospective study of U.S. military service members in the Millennium Cohort Study. Diabetes Care, 2013; 36(10): 3154-3161.

81. WHO/Wonca joint report: Integrating mental health into primary care - a global perspective. WHO Library Cataloguing-in-Publication Data. Singapore, 2008.

82. Silverstein J, Cheng P, Ruedy K, Kollman C, Beck R, Klingensmith G, Wood J, Willi S, Bacha F, Lee J, Cengiz E, Redondo M, Tamborlane W. Depressive Symptoms in Youth with Type 1 or Type 2 Diabetes: Results of the Pediatric Diabetes Consortium Screening Assessment of Depression in Diabetes Study. Diabetes Care, 2015; 38(12): 2341-3.

83. Friis, A. M., Johnson, M. H., Cutfield, R. G., Consedine, N. S. A Randomized Controlled Trial of a Mindful Self-Compassion Intervention Improves Depression, Distress, and HbA1c Among Patients With Diabetes. Diabetes Care, 2016; 39:1963-71.

84. Katon WJ, Von Korff M, Lin EH, Simon G, Ludman E, Russo J, et al. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. Arch Gen Psychiatry. 2004; 61:1042–9.

Appendix

QUESTIONNAIRE

THE EFFECT OF DIABETES MELLITUS ON THE PRESENTATION OF DEPRESSION IN A PRIMARY CARE POPULATION IN SAUDI ARABIA

Instruction

We conduct this research to determine the prevalence and impact of diabetes mellitus on the depression presentations in Al Khobar PHC clinics. In order to provide information that contributes to the improvement of the chronic disease case control and providing an excellent service.

We ask you to agree to join this research, which includes answering the questions of this questionnaire and see your file to know the type and dosage of treatments and laboratory analysis.

Your answer will be confidential and will not be viewed by anyone. Your name will not be written in the questionnaire. The questionnaire will not be retained after analyzing the information and participating in an optional questionnaire. You are free to stop answering the questionnaire at any time you like.

Thank you for your contribution

Researcher

Abdullah Al-Khathami

050845821

Date: **PHC Name:** **File No.: Part one:**

Personal Data:

Please insert (√) in front of your choice

1-	Gender ☐ Male ☐ Female
2-	Marital Status: ☐ Married ☐ Divorced ☐ Widow ☐ Single
3-	Age: …….years
4-	Nationality: ☐ Saudi ☐ Non-Saudi

4-	Marital Status: ☐ Married ☐ Divorced ☐ Widow ☐ Single
5-	Education Level: ☐ Illiterate ☐ Elementary ☐ Intermediate ☐ Secondary ☐ University ☐ Master ☐ PhD
6.	Type of house: 1. Rent……. 2. Own …….
7.	Job: 1. Jobless ….. 2. House-wife……. 3. Student ……. 4. Govermental …… 5. Private ……. 6. Owen …… 7. Retaired……
8.	Family members No. (……..)
9.	Income: 1. less than 3000 SR/M ….. 2. 3000-6000 SR/M ….. 3. 6000-10000 SR/M …… 4. 10000-15000 SR/M ……. 5. More than 15000 SR/M ……..
10.	Diabetes Mellitus / depression - Are you with diabetes? 1. Yes 2. No If yes, how many years ago ……. - Have diabetes been controlled? 1. Yes ….. 2. No …… - Determine your commitment to diabetes medication 1. non-compliant ……. 2. sometimes ……. 3. most often …… 4. very committed …….. - Have you ever been diagnosed with psychiatric disorders? 1. No ….. 2. Depression ……. 3. other Select …… …… If you have mental disorders, do you receive any treatment for these disorders other than this center? 1. Yes ….. 2. No …..

	- Did you sleep in hospital or intensive care and why? 1. Yes ..... 2. No..... reason.....
12.	Life-style Limit your commitment to diet complain 1. Non-compliant 2. Sometimes 3. Most often 4. Very committed Physical activity: 1. Regular (30 minutes walking a day or more) ..... 2. Irregular .... 3. I do not exercise..... - Do you have trouble sleeping? 1. Yes ..... 2. No ..... 3. Sometimes ..... - Do you suffer from a change in weight? 1. No ..... 2. Increase ..... 3. Decrease .....
13.	Family history Does your family have diabetes? 1. Yes ..... 2. No ..... 3. Not sure ..... - Is a member of your family suffering from a psychiatric illness? 1. Yes ..... 2. No ..... 3. Not sure ..... - Smoking: 1. Do not smoke ..... 2. Smoke cigarettes ..... 3. Pipe ..... 4. Shisha ..... 5. X-smoker ..... - If you smoke cigarettes how many cigarettes a day? 1. Less than 10 ..... 2. From 10 to 20 ..... 3. More than 20 ..... - Use alcohol and narcotic drugs: 1. Yes ..... 2. No ..... 3. Previously .....
14.	Your satisfaction with the primary health care provided to you (in general) 1 = Not very satisfied 2 = Not satisfied 3 = Not sure 4 = Satisfied 5 = Very satisfied

Over the last 2 *weeks*, how often have you been bothered by any of the following problems? *(use "✓" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

- End -

Thank you for giving us a time to fill this questionnaire

Part 2. File information

..... :BP -3 ..... height -2 ..... weight - 1

BMI……..

HB A1c - 5 FBG -4

TG -7 Total cholesterol -6

HLD -9 LDL -8

no - 2 yes - 1 ؟Any DM complication .10

؟If yes define…….

no -2 yes -1 ؟is there other chronic diseases – 14

..... ؟if yes please define -15

استبيان

تأثير مرض السكري على مرضى الاكتئاب بمراجعي مراكز الخبر - 2017م.

معلومات تقرأ للمستجيب:

نقوم بالبحث للتعرف على معدل الإنتشار وتأثير الاضطرابات النفسية على معالجة مرضي السكري بعيادات الخبر. وذلك لأجل توفير معلومات تساهم في تحسين وتطوير برنامج الامراض المزمنة وتساعد على تقديم خدمة متميزة للمرضى.
نطلب منكم الموافقة على الإنضمام لهذا البحث والذي يتضمن الإجابة على أسئلة هذا الاستبيان والاطلاع على ملفكم للتعرف على نوع وجرعة العلاجات والتحاليل المعملية.
إجابتك سوف تكون سرية ولن يتطلع عليها أحد ولن يتم كتابة اسمك بالاستبيان ولن يتم الاحتفاظ بالاستبيان بعد تحليل المعلومات ومشاركتك في الاستبيان اختيارية ولك مطلق الحرية في التوقف عن الإجابة على الاستبيان في أي وقت تحب.

شكرا على المشاركة والمساعدة

الباحث

د.عبدالله دخيل الخثعمي

تأثير مرض السكري على مرضى الاكتئاب بمراجعي مراكز الخبر

التاريخ / / م إسم المركز الصحي ..... رقم الإستمارة

رقم الملف: ..... الهاتف الجوال

(إختياري):..... الجزء الأول: معلومات عامة عن المريض والمرض

ضع علامة (√) على الاجابة المختاره

أسئلة شخصية عامة	
1.	**العمر:** .....
2.	**الجنس** : 1) ذكر ☐ 2) أنثى ☐
3.	**الحالة الاجتماعية:** 1. متزوج ☐ 2. عازب ☐ 3. مطلق ☐ 4. أرمل ☐
4.	**المستوى التعليمي:** 1. أمي ☐ 2. محو امية ☐ 3. ابتدائي/متوسط ☐ 4. ثانوي ☐ 5.جامعي ☐ 6. دراسة عليا ☐
5.	**نوع السكن:** 1) سكن ملك ☐ 2. مستأجر ☐
6.	**العمل الحالي: 1.** عاطل ☐ 2. ربة منزل ☐ 3. طالب ☐ 4. موظف حكومي ☐ 5) عمل حر ☐ 6. موظف قطاع خاص ☐ 7. صاحب عمل ☐ 8. متقاعد (معاشي) ☐
7.	**عدد أفراد الأسرة: ( )**
8.	**الدخل الشهري للأسرة (بالريال السعودي)** 1) أقل من 3000 ☐ 2) 3000 – 6000 ☐ 3) 6 000 - 10000 ☐ 4) 10000 - 15000 ☐ 5) أكثر من 15000 ☐
معلومات عن الأمراض المزمنة	
9.	**هل أنت مصاب بمرض السكري؟** 1. نعم ☐ 2. لا ☐
10.	**إذا كانت الاجابة نعم منذ كم سنة** ☐
11.	**هل تم التحكم بمرض السكري؟** **1.** نعم ☐ 2. لا ☐
12.	**حدد مدي التزامك بأخذ ادوية السكري** 1. غير ملتزم ☐ 2. بعض الأحيان ☐ 3. أغلب الأحيان ☐ 4. ملتزم جداً ☐
13.	**هل اصبت بنوبة هبوط في السكر؟** **1. لا** ☐ 2. نعم بسيطة ☐ 3. نعم تم دخولي للمستشفى ☐
أسلوب الحياة	
14.	**حدد مدي التزامك بالحمية الغذائية (4 ملتزم جداً -1 غير ملتزم)** 1. غير ملتزم ☐ 2. بعض الأحيان ☐ 3. أغلب الأحيان ☐ 4. ملتزم جداً ☐
15.	**النشاط البدني: 1.** منتظم (30 دقيقة مشي في اليوم أو أكثر) 2. غير منتظم ☐ 3. لا أمارس ☐
16.	**هل تعاني من صعوبه في النوم؟ 1.** نعم ☐ **2.** لا ☐ **3.** بعض الاحيان ☐
17.	**هل تعاني من تغيير في الوزن؟** **1.** لا ☐ **2.** زيادة ☐ **3.** نقصان ☐

18.	**هل تم تشخيصك من قبل بالإصابة بالإضطرابات نفسية؟** 1. لا ☐ 2. كآبة ☐ 3. قلق ☐ 4. فصام ☐ 5. أخرى حدد .....
19.	**إذا كنت تعاني من إضطرابات نفسية هل تتلقى أي نوع من العلاج لهذه الإضطرابات بمكان آخر غير هذا المركز ؟** **1. نعم** ☐ **2. لا** ☐
20.	**هل تنومت في المستشفى او العناية المركزة ولماذا؟** 1. نعم ☐ 2. لا ☐ السبب ـــــ
التاريخ العائلي	
21.	**هل أحد أفراد عائلتك مصاب بمرض السكري؟** **1.** نعم ☐ **2.** لا ☐ **3.** غير متأكد ☐
22.	**هل أحد أفراد عائلتك مصاب بمرض نفسي؟** **1.** نعم ☐ **2.** لا ☐ **3.** غير متأكد ☐
23.	**التدخين:** 1. لا أدخن ☐ 2.أدخن السجائر ☐ 3. غليون ☐ 4 . شيشه ☐ 5 . مدخن سابقاً ☐
24.	**إذا كنت تدخن السجاير كم سيجارة يومياً؟** 1. اقل من10 ☐ 2. من10 – 20 ☐ 3. اكثر من 20 ☐
25.	**استخدم الكحول والمواد المخدرة:** 1. نعم ☐ 2. لا ☐ 3. سابقاً ☐

الجزء الثاني: إستبيان عن صحة المرضى (PHQ-9)
خلال الأسبوعين الماضيين، كم مرة عانيت من أي من المشاكل التالية؟

الرقم	الموضوع	ولا مرة	عدة أيام	أكثر من نصف الأيام	كل يوم تقريباً
1	قلة الاهتمام أو قلة الاستمتاع بممارسة أو بالقيام بأي عمل	0	1	2	3
2	الشعور بالحزن أو ضيق الصدر أو اليأس	0	1	2	3
3	صعوبة في النوم أو نوم متقطع أو النوم أكثر من المعتاد	0	1	2	3
4	الشعور بالتعب أو بامتلاك القليل جداً من الطاقة	0	1	2	3
5	قلة الشهية أو الزيادة في تناول الطعام عن المعتاد	0	1	2	3
6	الشعور بعدم الرضا عن النفس أو الشعور بأنك قد أخذلت نفسك أو عائلتك	0	1	2	3
7	صعوبة في التركيز مثلاً أثناء قراءة الصحيفة أو مشاهدة التلفزيون	0	1	2	3
8	بطء في الحركة أو بطء في التحدث عما هو معتاد لدرجة ملحوظة من الآخرين/أو على العكس من ذلك التحدث بسرعة وكثرة الحركة أكثر من المعتاد	0	1	2	3
9	راودتك أفكار بأنه من الأفضل لو آنت ميتا أو أفكار بأن تقوم بإيذاء النفس	0	1	2	3

الجزءالرابع : مستوى الرضا عن الخدمات المقدمة :

نرجو التكرم باختيار الرقم الذي يحدد مدى رضاؤكم عن الخدمات الصحية المقدمة في المركز على النحو التالي

1 = غير راض جدا **2** = غير راض **3** = غير متأكد **4** = راض **5** = راض جداً

الخدمات الصحية المقدمة في المركز	غير راض جداً	غير راض	غير متأكد	راض	راض جداً
1. مدى رضاؤك عن الرعاية الصحية الأولية المقدمة لك (بصورة عامة)	1	2	3	4	5

شكراً لكم على تفضلكم بملء هذا الاستبيان ...

تأثير مرض السكري على مرضى الاكتئاب بمراجعي مراكز الخبر

معلومات ملف المريض:

التاريخ: / / م **رقم الملف:**..... **رقم** ☐☐ ☐☐☐

الإستمارة :

قم بتدوين المعلومات أدناه من ملف المريض :

1 - الوزن ..... 2- الطول ..... 3- قياس الضغط: .....

BMI.....

4- تحليل السكر صايم (FBG) 5 - (HB A1c)

6- معدل الدهون Total cholesterol 7- معدل الدهون الثلاثية TG

8- معدل الدهون قليل الكثافة LDL 9- معدل الدهون عالي الكثافة HLD

10. هل يوجد مضاعفات للمرض؟ ☐ 1☐نعم 2 - لا

- إذا كان الجواب بنعم حدد في .....